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ROSEN AVIATION

7" Widescreen Display

Technical Manual

7004 Series

Document Number 106211
Rev B

Technical Manual, 7” Widescreen Display

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1. INTRODUCTION

Rosen’s new 7004 series of personal displays allow for direct upgrades for high-definition and Composite units with a variety of existing bases on your aircraft. In addition to the sleek, tablet-style display, the touch-sense front panel enables source select capability directly from the front panel on select models depending on the base. The 7004 models differ depending on the plug-in arm configuration and input signal. All SDI models (7004-3xx) support 3G HD-SDI up to 1080p, and are compatible with the Rockwell Collins Venue™ system using RS-232.

This manual describes the compatibility of bases and display models, and it provides general instructions about how to install the new arm-mounted displays onto your aircraft and confirm that they are functioning correctly.

Note: Only trained and qualified personnel should perform installation and service.

Technical drawings and the Technical Manual are available on the Rosen Aviation website at www.rosenaviation.com. From the home page, select the **Products** tab and browse by product category. Please contact Technical Support at 541.342.3802 if you need assistance locating product information.

1.1. Base Compatibility

The tables below show which bases are compatible with the new 7004 displays. For a comparison of base-mounting diagrams, see Base Installations, beginning on page 12, to compare. Bases are sold separately.

Table 1 Composite (CVBS) display and base compatibility

Display Model	Description	Base Type	Base Model & Aircraft Connections	
7004-013	7" Center mount, Non-locking arm	Micro-D	0100-002 0100-004	DB9 with source select
7004-060	7" Left mount, Non-locking arm	Micro-D	0100-005	Molex/BNC without source select
7004-061	7" Right mount, Non-locking arm	Micro-D	0100-005	Molex/BNC without source select
7004-015	7" Center mount, Non-locking arm	CVBS Pogo	0100-041 0100-042	DB9 with source select
7004-037	7" Center mount, Locking arm	CVBS Pogo	0100-040	Molex/BNC without source select

Table 2 SDI display and base compatibility

Display Model	Description	Base Type	Base Model & Aircraft Connections	
7004-362	7”, SDI, Left mount, Non-locking SlimLine SDI arm	SDI Pogo	0100-344	RS-232 with source select
7004-363	7”, SDI, Right mount, Non-locking SlimLine SDI arm			
7004-315	7”, SDI, Center mount, Non-locking SlimLine SDI arm		0100-342	RS-232 without source select
7004-337	7”, SDI, Center mount, Locking SlimLine SDI arm			

2. SYSTEM OVERVIEW

The typical installation of personal displays consists of multiple arm-mounted displays connected to a video source. The following figures show how to configure analog (standard definition) and HD displays to create a complete cabin entertainment system or integrate a display into an existing system.

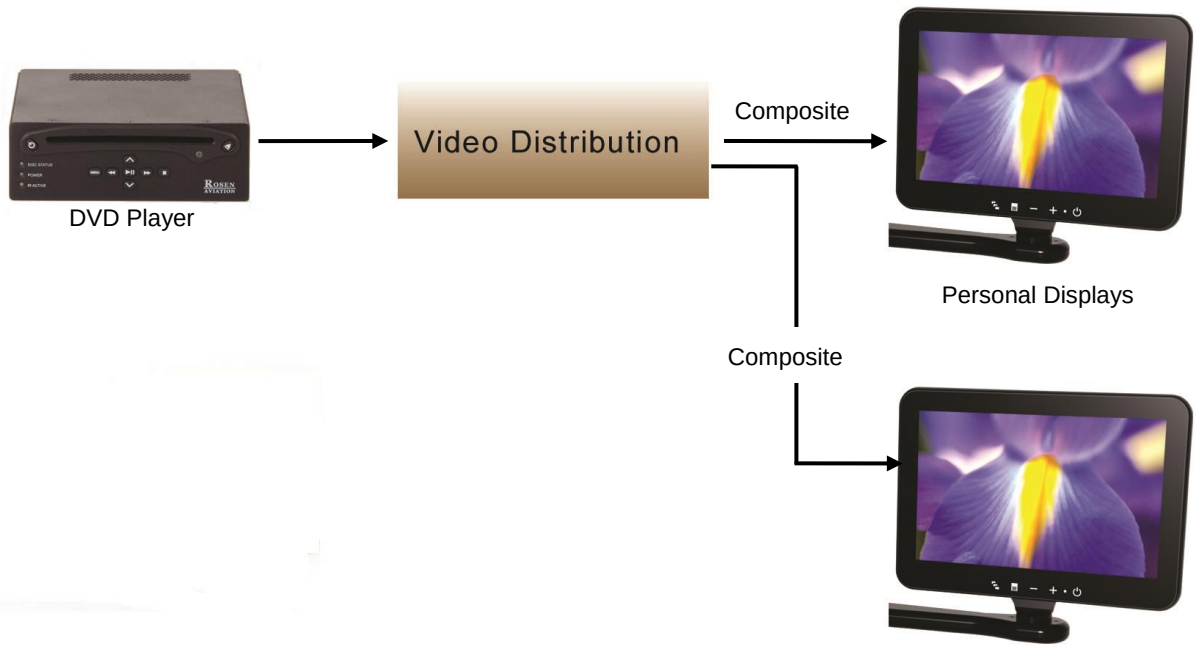


Figure 1 Connecting analog displays

These displays are typically connected to a video distribution unit, which provides a single Composite video signal (NTSC, PAL, or SECAM) to each display. The video distribution box performs the source selection.

2.1. High-definition Systems

SDI units display either standard definition (SD) or high-definition (HD) video using serial digital video input. In this configuration, the video is sourced by a digital video distribution switch or source and de-serialized into an SDI format.

High-definition displays are typically installed in a system where the SDI video is distributed from a cabin management system and/or HD video distribution to each display.

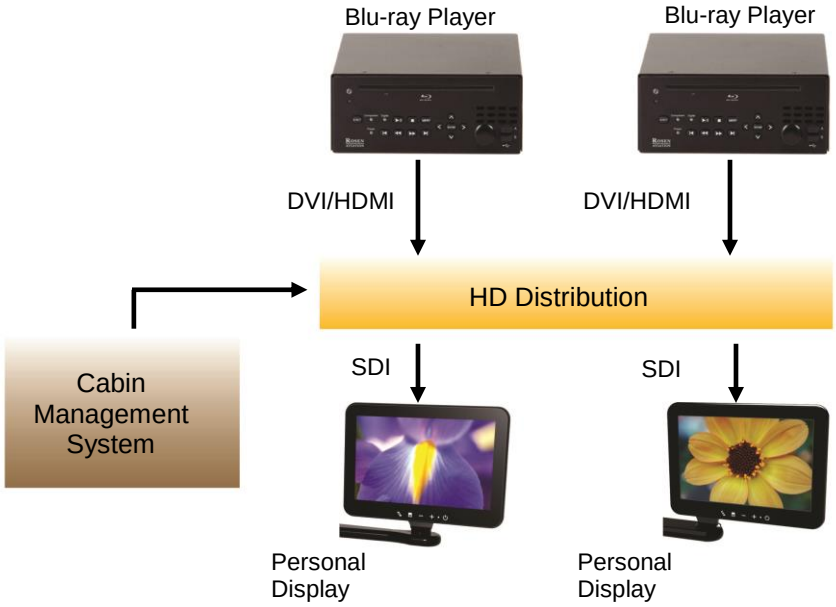


Figure 2 Connecting HD displays

3. INSTALLATION GUIDELINES

The 7” arm-mount displays plug in to round bases depending on the connector type and input signal. Ensure the correct orientation when plugging the arm into the base receptacle, as shown below, so that the alignment pin in the base follows the arm’s keyed slot connection and is not forced.

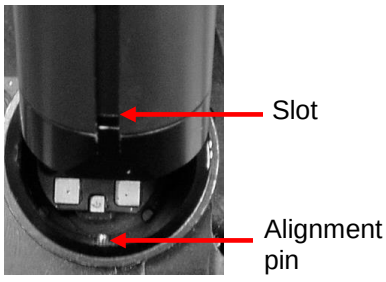


Figure 3 Arm and base interface

3.1. Installing/Removing SlimLine Arm Assemblies

To install a SlimLine arm assembly, press the arm button all the way in and push straight down on the arm into the plug body until it is secure in the base.

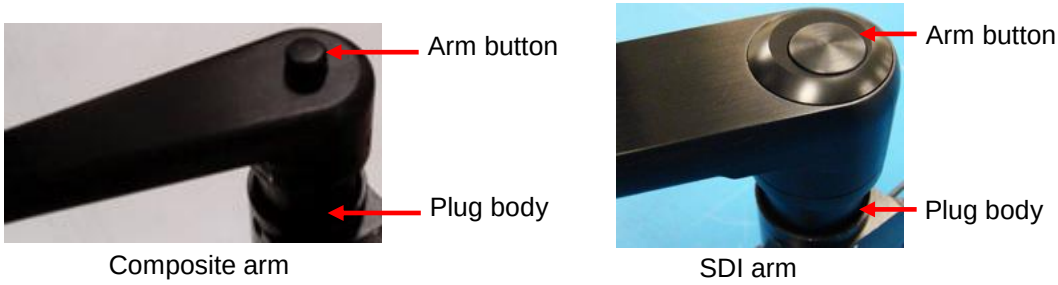


Figure 4 SlimLine locking arm features

To remove a SlimLine arm assembly, press the arm button in all the way and lift up on the display/arm assembly.

3.2. Stowing a Locking Arm Display

SlimLine locking arm displays have two locking points at 0º and 180º to secure displays in a stowed position, without disconnecting power, during taxiing, takeoff, and landing (TTL).

To stow a SlimLine locking arm display, rotate the arm to either 0º or 180 º until it locks. To deploy a SlimLine locking arm display, press the arm button halfway and rotate the arm away from the locked position.

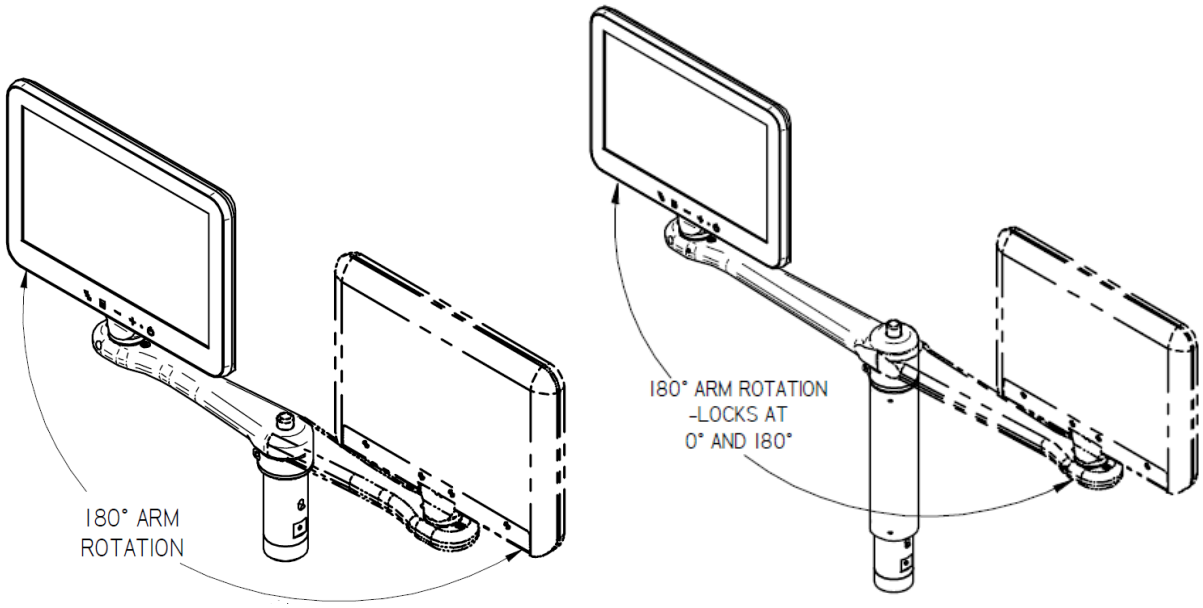
Figure 5 Stowing positions for SlimLine locking arm displays

To stow a SlimLine SDI locking arm, rotate the arm until it locks into either stowed position. To deploy, press the arm button and rotate the arm away from the locked position.

Figure 6 Arm button on SlimLine SDI locking arms

NOTICE Touching the LCD with excessive force may leave pressure spots that show in video display. Handle with care.

3.3. CVBS Pogo Connection Displays

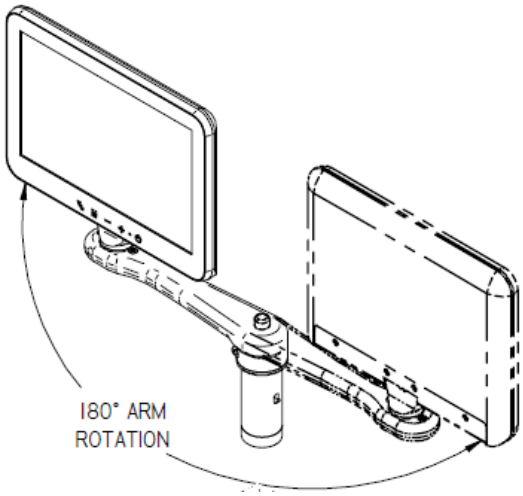


P/N **7004-015**, 7" Display: Pogo, non-locking, center

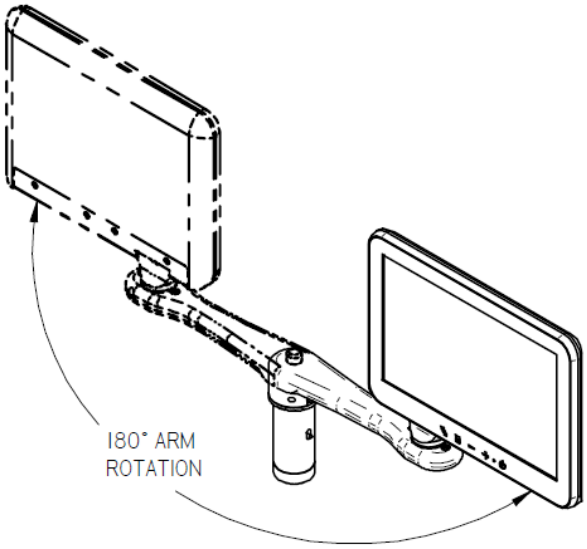
P/N **7004-037**, 7" Display: Pogo, locking, center

Figure 7 Pogo connection displays use base receptacles 0100-040, 0100-041, & 0100-042

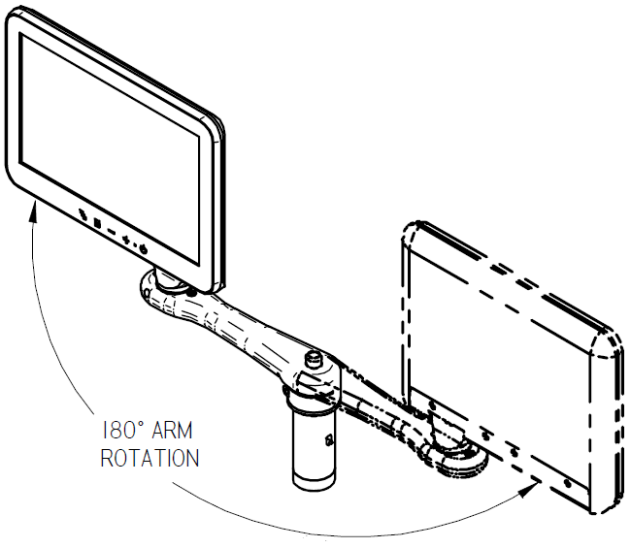
3.4. CVBS Micro-D Connection Displays



P/N **7004-013**, 7" Display: Micro-D, non-locking, center



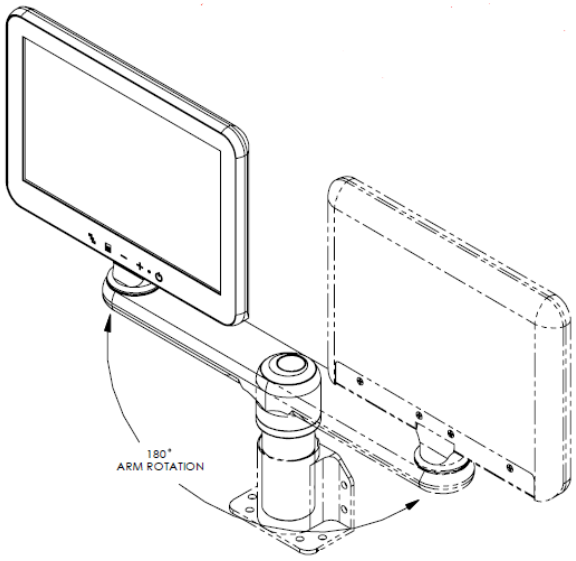
P/N **7004-060**, 7" Display: Micro-D, non-locking, left



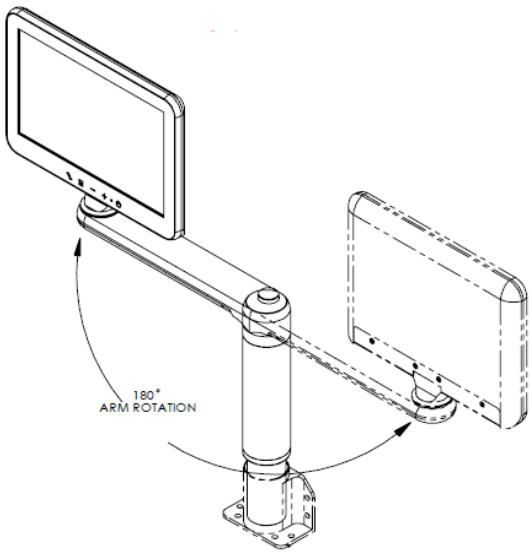
P/N **7004-061**, 7" Display: Micro-D, non-locking, right

Figure 8 Micro-D connection displays use base receptacles 0100-002, 0100-004, & 0100-005

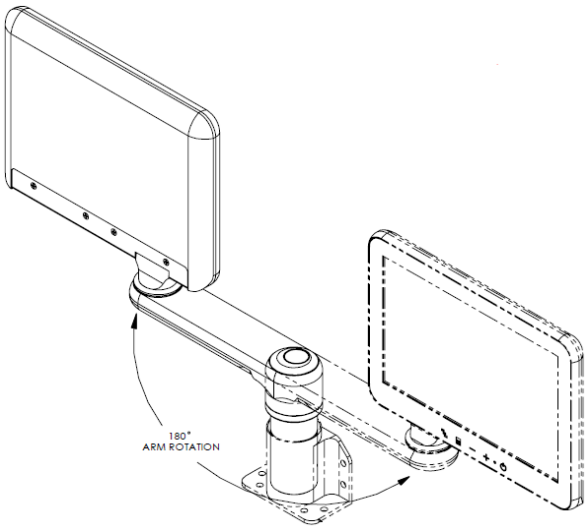
3.5. SDI Pogo Connection Displays



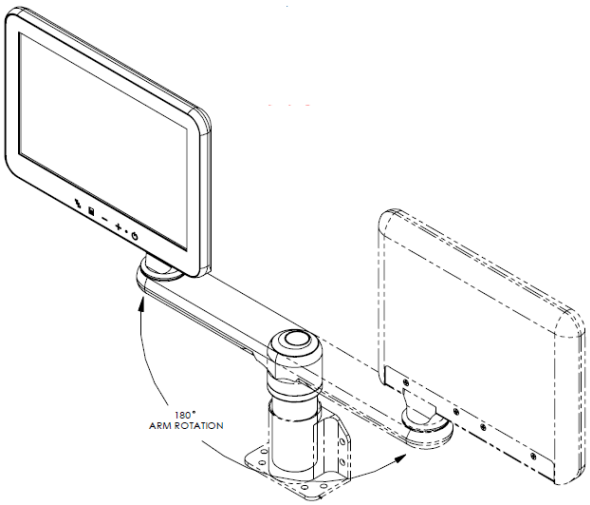
P/N **7004-315**, 7" Display: non-locking, center



P/N **7004-337**, 7" Display: locking, center



P/N **7004-362**, 7" Display: non-locking, left



P/N **7004-363**, 7" Display: non-locking, right

Figure 9 SDI Pogo-style connection displays use base receptacles 0100-344 & 0100-342

3.6. Base Installations

Consult the *Outline and Installation* drawing to assist with the installation process. Pay close attention to the dimensions and fastener depths required when considering installation requirements.

The 7004 displays are compatible with the base designs, as shown below. Bases mount on either a vertical or a horizontal surface, typically with a minimum of four screws (two per flange). For base pinout information, refer to the display drawings on the Rosen Aviation website.

3.6.1. CVBS Pogo Base Receptacles

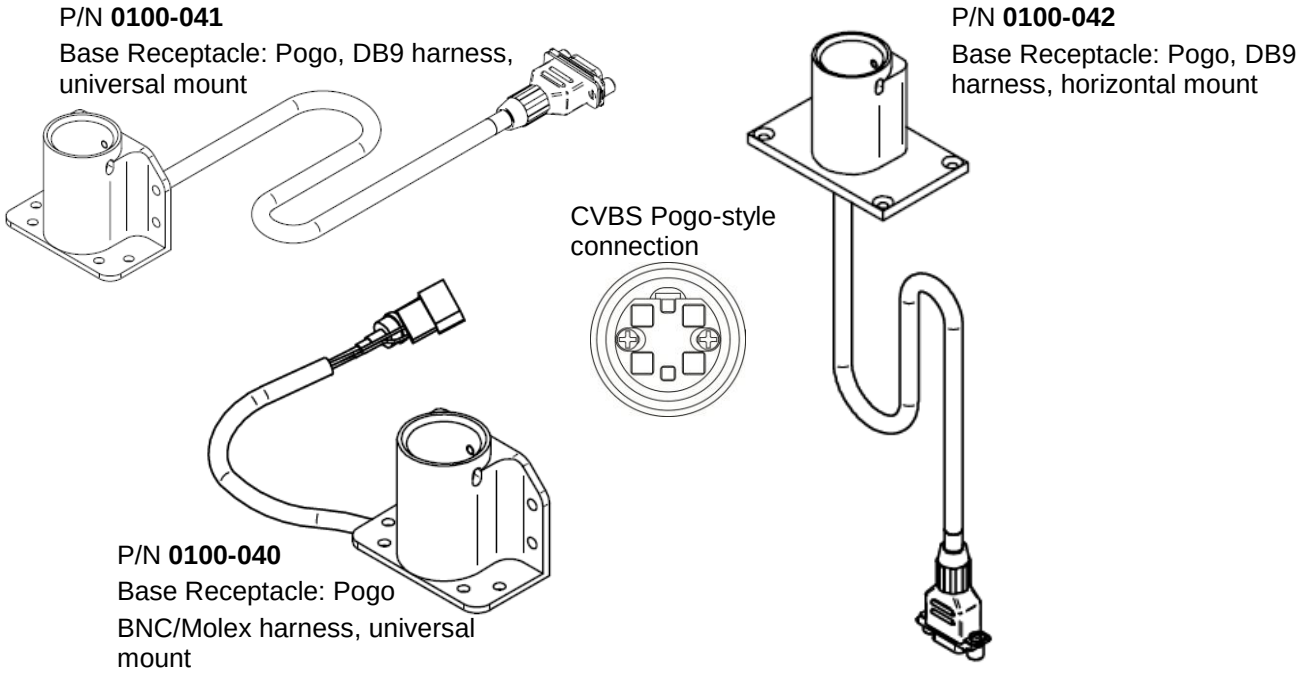


Figure 10 CVBS Pogo-style base receptacles

3.6.2. SDI Pogo Base Receptacles

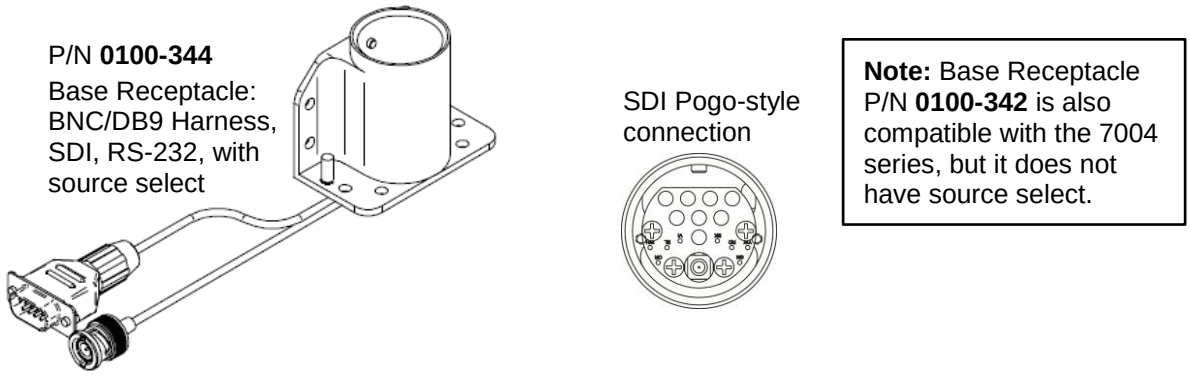

P/N **0100-344**
Base Receptacle: BNC/DB9 Harness, SDI, RS-232, with source select
SDI Pogo-style connection
Note: Base Receptacle P/N **0100-342** is also compatible with the 7004 series, but it does not have source select.

Figure 11 SDI Pogo-style base receptacle

3.6.3. CVBS Micro-D Base Receptacles

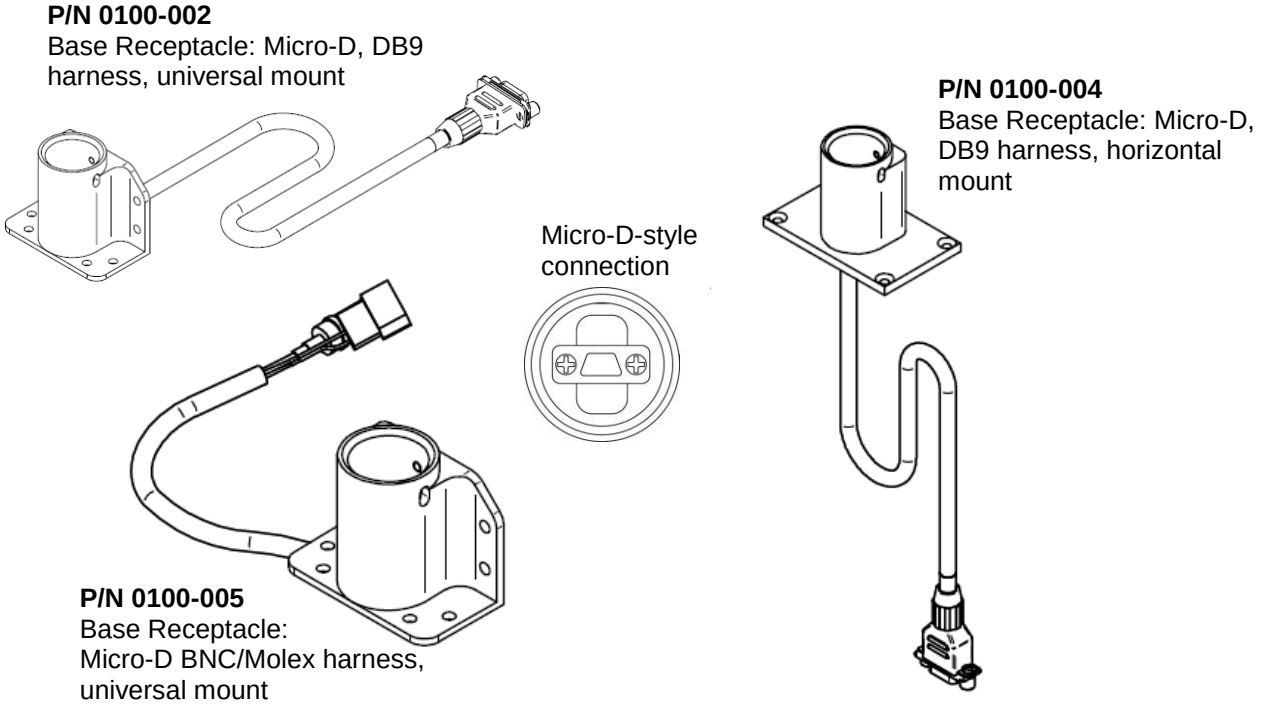

P/N 0100-002
Base Receptacle: Micro-D, DB9 harness, universal mount
P/N 0100-004
Base Receptacle: Micro-D, DB9 harness, horizontal mount
Micro-D-style connection
P/N 0100-005
Base Receptacle: Micro-D BNC/Molex harness, universal mount

Figure 12 CVBS Micro-D-style base receptacle

3.7. Electrical Requirements

- Nominal voltage 28VDC / 0.30A
- Inrush Current 20A for 250 microseconds
- Op Voltage/Current Range 18VDC/0.45A – 32VDC/0.27A
- Max Power Consumption: 8.6 W

3.8. Pinout Connections

There are several ways to connect a personal display to an aircraft’s entertainment system. Use the pinout descriptions on the monitor’s *Outline and Installation* drawing to assist in completing the wiring connections.

Note: This display is for entertainment purposes only; connect to a non-critical power bus.

3.8.1. RS-232 Control

The SDI displays can be controlled via a cabin management system using RS-232, if an RS-232 connection is present on the configuration. The display connects to 28VDC aircraft power and receives video through a video distribution amplifier or directly from video sources.

For a copy of the *RS-232 External Controller Message Formats* (P/N **9002934**), please contact Rosen Aviation Technical Support at 541.342.3802.

4. INITIAL POWER UP

Make sure to turn off the power before connecting the harnesses.

1. Ensure low impedance ground connections on the base.
2. Ensure that **28VDC** power supply is **OFF**.
3. Connect the power supply and video source to the appropriate harnesses.
4. Plug in the display/arm assembly.
5. Supply power and wait for a video signal on the screen. The default power setting is Auto On.

NOTICE

When cycling power, leave unit off for 20 seconds before restoring power.

5. DISPLAY TOUCH CONTROLS

The 7004 displays have touch-sense buttons on the front panel to control all operating functions; however, the 7004-3*xx* models can be controlled from the Rockwell Collins Venue system. Use the plus (**+**) and minus (**–**) buttons to navigate through the options.

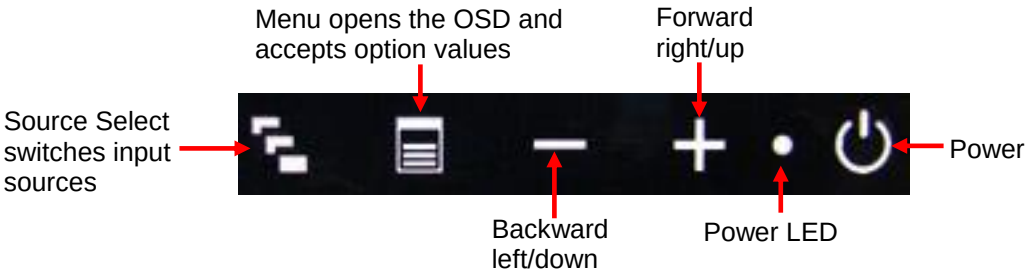


Figure 13 Touch controls and functions

5.1. Source Select

Source Select is available depending on the base and video distribution installations on the aircraft. To change between video sources, press Source Select, either on the front panel or the remote control.

6. OSD MENU OPTIONS

The OSD contains screen settings and options in menus and informational readouts that display over the image, as shown below. Press **Menu** on the front panel to open the Main Menu, as shown in Figure 15 on page 15.

Press **+** and **–** to navigate within the menu pages, options, and values columns. Select the **Back** option to switch menu pages. The yellow highlighted area shows the currently selected option.

- Press **Menu** and **+** to move right across the menu page options and values.
- Press **Menu** and **–** to move left across the menu page options and values.

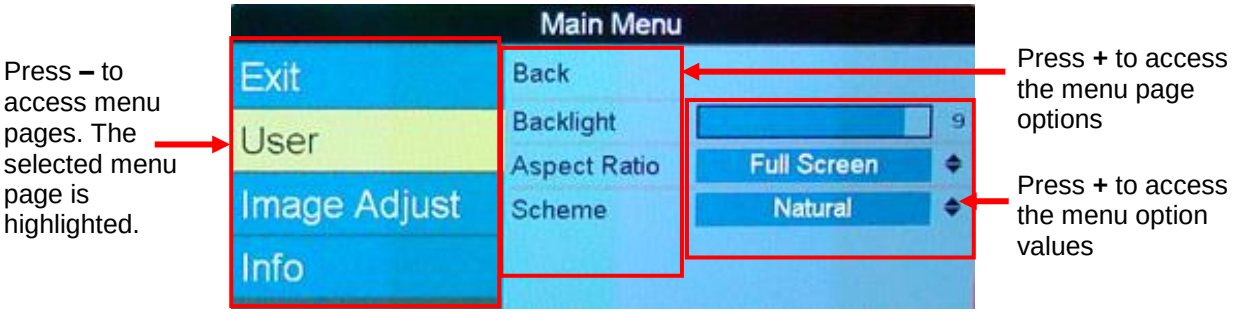


Figure 14 OSD menu pages

The available menu options will vary depending on which source signal is active.

- Press **Menu** to choose a setting or an option.
- Select the **Back** option to switch menu pages.
- Select **Exit** and then press **Menu** to close the OSD and save the settings.

Note: The on-screen display will timeout and automatically close after no screen activity for a preset amount of time, which is adjustable on the Technician Menu→ OSD Timeout option. See Section 7.3, OSD Timeout, on page 24.

6.1. Exit

Use Exit to close the OSD. When you press **Menu**, the OSD opens to this screen, as shown below. Press **Menu** again to close the OSD from this screen.

Press **+** and **–** to access the other menu pages in the OSD.

From other settings within the OSD, select **Back** and **Exit** to close the OSD.

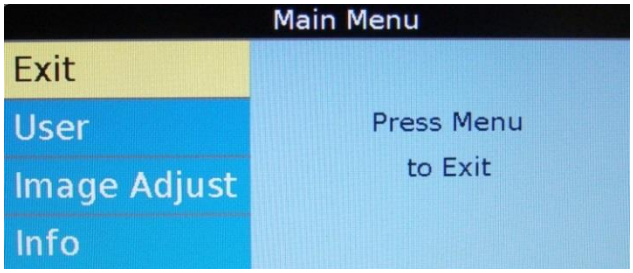


Figure 15 Opening screen for the Main Menu

6.2. User Menu

The User Menu contains frequently used control settings. Press **Menu** to open the Main Menu, and press **–** and **Menu** to access the User Page options.

Press **+** or **–** to select a User option, and then press **Menu** to change its value.

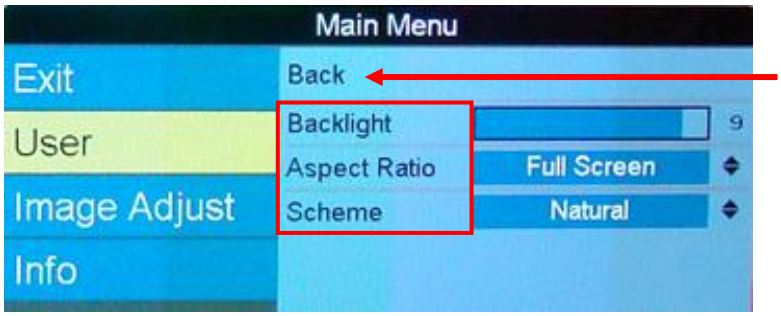


Figure 16 User menu options

6.2.1. Backlight

Use this setting to adjust the intensity of the LCD backlight.

From the **User** page, press **+** and **–** to select **Backlight**, and then press **Menu** to open the control bar shown below.

Press **+** and **–** to change the value on the control bar accordingly.

Press **Menu** to set the backlight brightness and close the control bar.

Figure 17 Backlight option

6.2.2. Aspect Ratio

Use Aspect Ratio to adjust the picture expansion to match the encoding of the source image most closely.

Select **User→Aspect Ratio** and then press **Menu**. To switch the display between aspect ratio modes (described below), press the **+** and **–** buttons. Watch for proportional changes in the background picture and choose the optimal mode for the source. Press **Menu** to set the mode and select **Back→Exit** to close the OSD.

Full Screen: (Default) Displays standard 4:3 source video in 16:9 aspect ratio by expanding the image horizontally. Circles will appear as ovals in the central and outer portions of the screen. If the source image is letterboxed, there will be black bars at the top and bottom of the image. A 16:9 widescreen source will fill the screen with minimal distortion.

Pillar Box: A standard 4:3 source image will appear with vertical black bars on the left and right side of the image. If the image source is letterboxed, then there will also be horizontal bars at the top and bottom of the image as well.

Letter Box Expanded: Expands the source video in the vertical and horizontal dimensions to fill the display screen. Letterbox-format DVDs will have small or no bars showing in this mode, while 4:3 aspect video sources will expand beyond the screen boundaries and appear cropped.

6.2.3. Scheme

There are two default color settings or schemes: Natural and Vivid. If the screen colors are not what you expect, select Scheme and press **+** and **–** to toggle between the settings. The background picture’s colors change as you toggle between the settings. Vivid uses a higher color saturation level above the Natural level.

Try both schemes to determine which one you like best before adjusting the other picture quality settings.

Select **User→Scheme** and then press **Menu** to access the settings.

Select the setting and press **Menu** to accept the changes, and then select **Back→Exit** to close the OSD.

6.3. Image Adjust Menu

Use the Image Adjust menu options, as shown below, to control the color and picture quality. Highlight **Image Adjust** and press **Menu** to access the Image Adjust menu options.

Press **+** or **–** to select an Image Adjust option, and then press **Menu** to change its value.

Figure 18 Image Adjust menu options

6.3.1. Scheme

Scheme is also available from the Main Menu→User page. For information about how this option works, see Section 6.2.3, Scheme, on page 17. Changing the Scheme also affects changes that you make to the User menu settings and is source specific.

6.3.2. Picture-quality Controls

The Brightness, Contrast, Saturation, Hue, and Sharpness menu options use control bars to fine-tune different aspects of the picture quality. To adjust these options, press **Menu** and **–** to select **Image Adjust.** Choose a menu option, and then press **Menu** to open a control bar and adjust the value, similar to Figure 19, shown below.

Press **+** or **–** to increase or decrease the control’s value.

Press **Menu** to set the menu option and close the control bar.

Select **Back→Exit** to close the OSD.

Figure 19 Sample picture-quality control bar

6.3.3. Reset Scheme

Restores the values of the current scheme to their default settings, and it affects only the current source. Use Reset Scheme to revert to the default screen colors if the other Image Adjust options did not correct the screen quality.

Select **Image Adjust→Reset Scheme** and then press **Menu**.

Select **Back→Exit** to close the OSD.

For information about the different Scheme modes, see Section 6.2.3 on page 17.

6.3.4. Image Adjust Advanced (Submenu)

Use the Image Adjust Advanced submenu options, as shown below, to fine-tune the primary screen colors and to restore the monitor’s factory screen settings. Press **Menu** and **+** or **–** to select **Image Adjust→Advanced**, and then press **Menu**.

To close the menu, select the **Back** option, or select **Back→Exit** to close the OSD.

Figure 20 Advanced submenu options

6.3.4.1. Color Temperature

Use the Color Temperature options to change the warmth of the picture in all sources. When you select Color Temperature, the screen changes, and a toggle appears to switch between User and 6500K, as shown below.

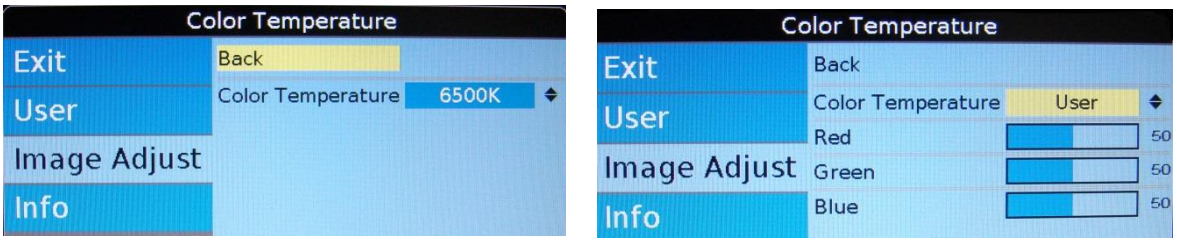


Figure 21 Color Temperature options

Press **–** and **Menu** to open the Color Temperature Page.

Press **–** to access the **User** setting and then press **Menu** and **–** to access the individual colors.

6.3.4.1.1. Color Levels: Red, Green, Blue

Setting the Color Temperature to User will make the Red, Blue, and Green options active. Each color adjusts the low-level registers of its respective color value in the picture.

Select the **Image Adjust→Advanced→Color Temperature** and press **Menu.** Set Color Temperature to **User**, and then press **Menu**.

Press **–** to choose a color level, and then press **Menu** to open a control bar to adjust the value, similar to Figure 22 shown below.

- **Red**: Press – to show more cyan-colored tones, and press + to intensify the red tones.
- **Green**: Press – to show more magenta tones, and press + to intensify the green tones.
- **Blue**: Press – to show more yellow tones, and press + to intensify the blue tones.

Press **Menu** to set the color and close the control bar.

Select **Back→Exit** to close the OSD.

Figure 22 Sample color-level control bar

6.3.4.2. Restore Defaults

This option restores the default screen settings from the user menus for all video sources. It does not erase Technician Menu settings or change the internal time and date. A Defaults Restored message appears in the lower corner of the menu after the restore is complete.

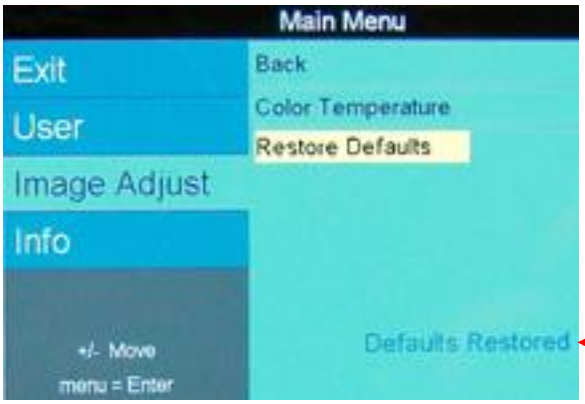


Figure 23 Restore Defaults option

6.4. Info

Use the Information page to review operating status, view details about the display, and access the Technician Menu.

To open the Info page, press **Menu** and then **–** to navigate to **Info**.

Notes:

- Press Menu and **+** to highlight the Back option—required to access the Technician Menu.
- The firmware (FW) fields vary by model and are subject to change.

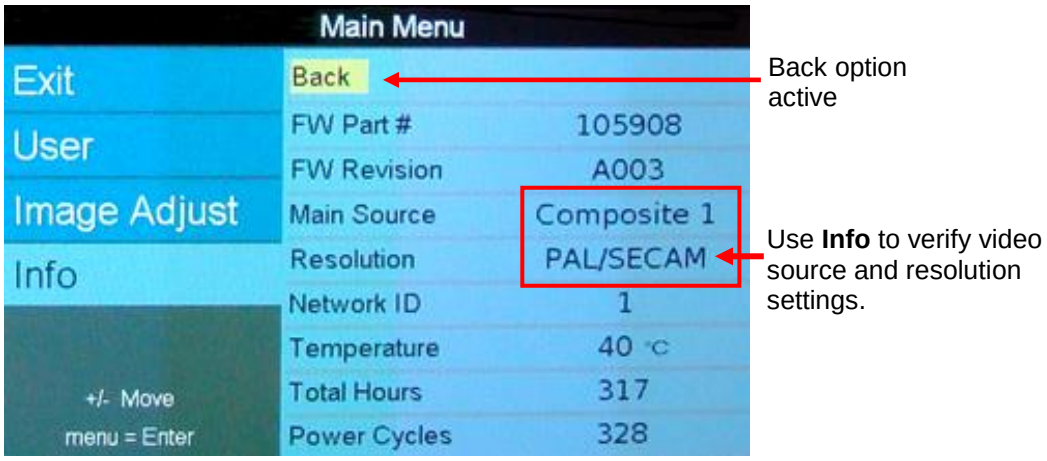


Figure 24 Info page

7. TECHNICIAN MENU

To protect the display from accidental or unintentional adjustments, the Technician Menu is accessible only with a special button combination. To avoid repeating this button sequence after each change, the menu remains active until you manually close it.

NOTICE Whenever there is a change to the OSD settings, exit the menu, and cycle power for the changes to be saved.

To open the Technician Menu, start with the display on, and press the following buttons in this order:

1. Press **Menu** and **–** to select the **Info** page.
2. With the **Back** option highlighted on the Info page, press **+ – + – + + +**, and then press **Menu**.
3. The Technician Menu opens.

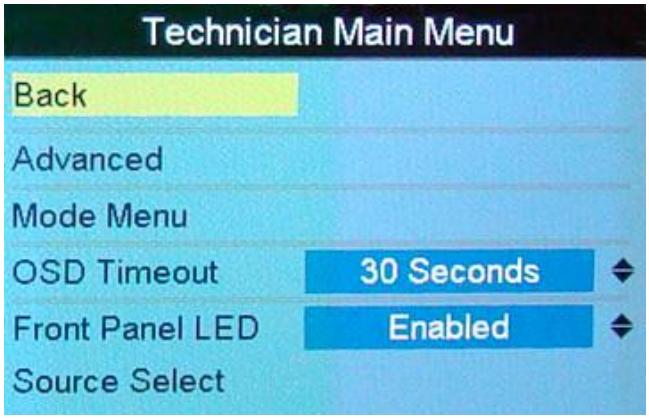


Figure 25 Technician Main Menu

To navigate the menu options, press **+** or **–** on the front panel.

To close the Technician Menu and return to the Main Menu, select the **Back** option and press **Menu**. To close the OSD, select **Exit** and then press **Menu**.

Note: The Main Menu options are not selectable while the Technician Menu is open.

7.1. Technician Advanced Submenu

This submenu provides installers and technicians more advanced controls of the image. The input signal determines which options will appear in the Technician Advanced submenu.

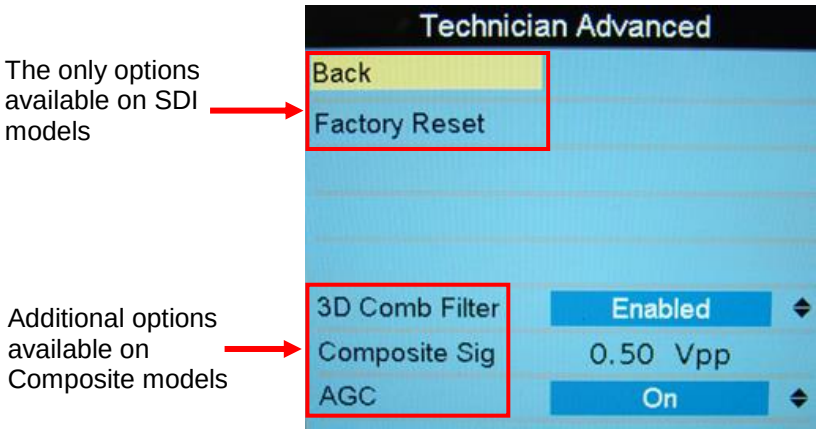


Figure 26 Technician Advanced submenu

7.1.1. Factory Reset

Choose this option to perform a complete factory restore. Factory Reset returns all options with pre-determined defaults in *both* the User and Technician menus to their factory default settings.

Highlight **Advanced→Factory Reset** and press **Menu**.

A *Reset Complete* message appears after the display restores the default settings. Remember to power cycle after performing a Factory Reset.

7.1.2. 3D Comb Filter

(Composite only) When set to Enabled (default), the display will eliminate dot crawl and some noise on stationary portions of the picture.

Highlight **Advanced→3D Comb Filter** and press **Menu**.

Use **+** and **–** to set the option **Enabled** or **Disabled**, and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.1.3. Composite Sig (Signal)

(Composite only) This is a read-only screen that shows the signal strength of the currently viewed Composite source. Composite Signal strength ranges from 0 to 1.25 Vpp in 0.25V increments. It will read NA (not available) if a Composite source is not active or the AGC (Automatic Gain Control) (below) is set to Off.

7.1.4. AGC (Automatic Gain Control)

(Composite only) This option is a signal compensation tool that will accommodate for strong and weak Composite signals.

Highlight **Advanced→AGC** and press **Menu**.

Use **+** and **–** to set the option **On** (default) or **Off**, and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.2. Technician Mode Menu

Use the Technician Mode Menu options to specify the Power Mode and to access the SDI Overscan settings (SDI models only).

From the Technician Main Menu, select **Mode Menu** and then press **Menu** to open the submenu, as shown below.

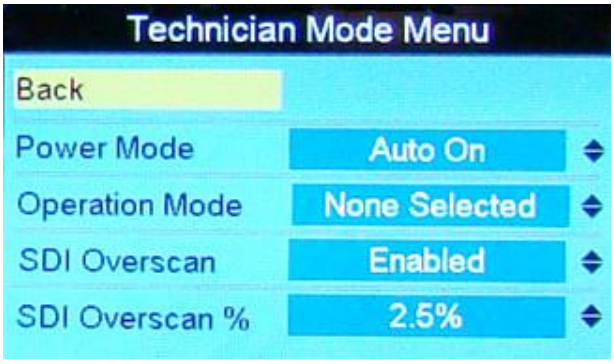


Figure 27 Technician Mode Menu

7.2.1. Power Mode

Use Power Mode to set the display’s initial power state.

From the Technician Menu, press **–** to select **Mode Menu→Power Mode** and then press **Menu**.

Use the **+** and **–** to set the option and then press **Menu**.

Options include the following:

- **Auto On:** The display always starts up in the ON state when 28V is applied (default).
- **Auto Off:** The display always starts up in the standby state when 28V is applied.
- **Restore Previous:** The display returns to the previous power settings after any power interruption.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.2.2. Operation Mode

Operation Mode is not enabled, and the None Selected setting is read-only.

7.2.3. SDI Overscan

(**For 7004-3*xx* models only**) Use SDI Overscan to enable or disable video overscan for SDI at 480i and 576i resolutions. When enabled, the setting cuts off a small percentage (2.5% by default) around the edges of the picture and it resizes the image to fit the full screen. When set to disabled, a zero percent overscan is applied to all SDI resolutions. You can also enable/disable this feature via the RS-232 protocol.

From the Technician Menu, press **–** to select **Mode Menu→SDI Overscan** and then press **ENTER**.

Use the **+** and **–** to set the option to **Enabled** or **Disabled**, and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.2.4. SDI Overscan %

(**For 7004-3*xx* models only**) Use SDI Overscan % to set the amount of overscan applied to the picture’s edges of SDI signals at 480i and 576i resolutions. The setting percentages are 0.0%, 2.5% (default), 3.0%, 5.0%, and 10.0%. The overscanned image will automatically update when you switch between percentage values. You do not have to cycle power for the change to take effect. You can also change the overscan value via the RS-232 protocol.

From the Technician Menu, press the **–** to select **Mode Menu→SDI Overscan %** and then press **Menu**.

Use the **+** and **–** to set the percentage option and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.3. OSD Timeout

Use OSD Timeout to set the amount of time the menu screens and control bars are visible, without making any changes, before they timeout and close automatically.

There are three increments: 6 Seconds, 15 Seconds, and 30 Seconds.

From the Technician Menu, press **–** to select **OSD Timeout** and then press **Menu**.

Use the **+** and **–** to select a time increment and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.4. Front Panel LED

The Front Panel LED option turns the power LED on or off. When the option is Disabled, the power LED will be black.

Figure 28 Front panel touchpad

When it is On, the power LED will have the following states:

- **Green** indicates the display is receiving power.
- **Amber** indicates the display is in standby mode.
- **Red** indicates the display is registering an error.
- **Black** indicates the display is receiving no power.

Highlight **Technician→Front Panel LED** and press **Menu**.

Use the **+** and **–** to set the option **Enabled** or **Disabled**, and then press **Menu**.

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

7.5. Source Select Menu

Use this submenu to adjust the Pulse Width and Repeat Delay of the source select signal. Pulse Width specifies the amount of time the pulse is active (when switching sources), and Repeat Delay specifies the amount of time between pulses being sent from the display.

Highlight **Technician Menu→Source Select**, press **–** to select a setting, and then press **Menu** to access the option.

Use the **+** and **–** buttons to increase or decrease the length of time the pulse width and repeat delay are active (in milliseconds), and then press **Menu**. The Pulse Width is always less than the Repeat Delay.

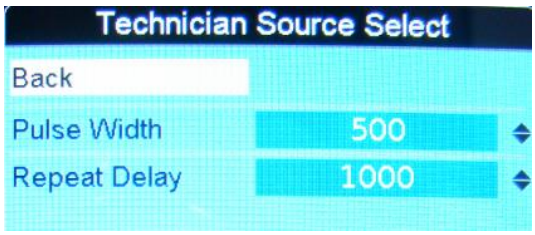


Figure 29 Source Select menu options and their default values

Select **Back** and press **Menu** to return to the Technician Menu.

To exit the OSD, select **Back** and **Exit**.

8. MAINTENANCE: TENSION ADJUSTMENTS

The 7004 series displays require fewer tension adjustments than the older 7002 models. The new monitor design features a lifetime friction hinge, so no tilt adjustment is ever required.

There are no adjustment points on the SlimLine SDI arms; however, the Composite arm mounts have two adjustment points. Adjust the screen pivot and arm rotation, if necessary, by torquing the socket head cap screws (SHCS), as shown below. Tighten both screws just until the screen pivots and the arm rotates with only minor resistance.

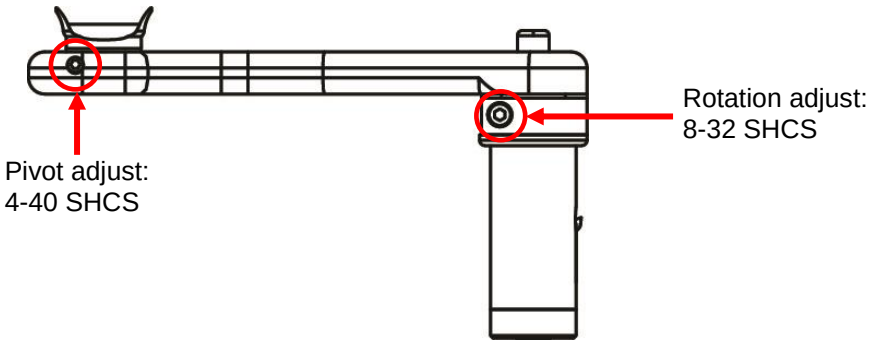


Figure 30 Tension adjustment points for Composite arm mount displays

9. TECHNICAL REFERENCES AND SUPPORT

NOTICE

Check the Rosen Aviation website to ensure that you are working with the most current revision of technical documentation.

If you need assistance in configuring a personal display to work with an HD system, please contact Rosen Aviation Technical Support at 541.342.3802.

Table 3 Technical references

Product	Part Number	Location
RS-232 External Controller Message Formats	**9002934**	Contact Rosen Technical Support
Displays’ Outline & Installation Drawings	**7004-*xxx*-CD**	www.rosenaviation.com
Base Outline & Installation Drawings	**0100-*xxx*-CD**	www.rosenaviation.com

9.1. Troubleshooting

If the display does not function properly, refer to the following troubleshooting table for symptoms and possible solutions before contacting Rosen Technical Support.

Note: Always use a multimeter to verify voltages. Check actual results against the requirements described in this manual.

Table 4 Troubleshooting tips

Problem	Possible Solutions
No video (signal)	• Verify that the display is turned on and the video is on. • Verify that a signal is reaching the display using an oscilloscope or another display. • Check the Power Control Pin. See the Power Mode settings on page 23. • Verify that the pinout is correct.
Screen is black	• Verify that the display is receiving power. • Check the Power Mode settings on page 23. • Verify that the pinout is correct. • Verify that the video source is on and playing. • Verify all connections between the source and the display.
Image flickers	• Try turning on the AGC (Automatic Gain Control) setting on page 23. • Verify that the signal cable is secure. • Verify that the vertical frame frequency is 60 Hz or less.
Distorted Image	• Verify proper connections, per the latest O&I drawings. • Verify supported resolution. • Check the Power Mode settings on page 23. • Verify that the pinout is correct. • Verify that a signal is reaching the display using an oscilloscope or another display. • Examine the display for pinched or damaged cables.
Wrong Colors	• Verify proper connections, per the latest technical drawings. • If the screen colors are not what you expect, reset the current scheme. For more information, see Reset Scheme on page 18 and Restore Defaults on page 20.

9.2. Cleaning the Display

To clean the LCD, very gently wipe the screen with a clean, commercially approved LCD cleaning cloth and alcohol-free LCD cleaning solution. Use one firm cleaning motion instead of circular or repeated side-to-side scrubbing.

9.3. RTCA DO-160F Qualifications for Displays

The table below shows the DO-160F compliance of the 7004 series displays and their corresponding bases. Omitted categories are not applicable to these products or their expected installations. Reference the Qualification Test Reports for specific details.

Table 5 The 7004 displays are compliant with the following DO-160F test criteria

Description	Section	Category	Comments
Temperature and Altitude	**4**		
Ground Survival/Short-Time Operating Low Temp	4.5.1	A1	
Operating Low Temperature	4.5.2	A1	
Ground Survival/Short-Time Operating High Temp	4.5.3	A1	
Operating High Temperature	4.5.4	A1	
Altitude	4.6.1	A1	
Decompression	4.6.2	A1	
Overpressure	4.6.3	A1	
Temperature Variation	**5**		
Temperature Variation	5.3.1	C	
Humidity	**6**		
Humidity	6.3.1	A	
Operational Shocks & Crash Safety	**7**		
Operational Shocks	7.2.1	B	(6G)
Crash Safety (Impulse)	7.3.2	B	(20G)
Crash Safety (Sustained)	7.3.3	B	(20G) SDI / (9G) CVBS
Vibration	**8**		
Random Vibration – Fixed Wing Aircraft	8.5.2	S (Curve B)	
Magnetic Effect	**15**		
Magnetic Effect	15.3	Z	
Power Input	**16**		
Normal Operating Conditions (DC)	**16.6.1**		
Average Value Voltage (DC)	16.6.1.1	Z	
Ripple Voltage (DC)	16.6.1.2	Z	
Momentary Power Interruptions (DC)	16.6.1.3	Z	
Normal Surge Voltage (DC)	16.6.1.4	Z	
Engine Starting Under Voltage Operation (DC)	16.6.1.5	Z	

Description	Section	Category	Comments
Abnormal Operating Conditions	**16.6.2**		
Voltage Steady State (DC)	16.6.2.1	Z	
Momentary Under Voltage (DC)	16.6.2.3	Z	
Abnormal Surge Voltage (DC)	16.6.2.4	Z	
Voltage Spike	**17**		
Voltage Spike	17.4	A	
Audio Frequency Conducted Susceptibility	**18**		
AF Conducted Susceptibility - Power Inputs	18.3.1	Z	
Induced Signal Susceptibility	**19**		
Magnetic Fields Induced Into Equipment	19.3.1	AC	
Magnetic Fields Induced Into Interconnecting Cables	19.3.2	AC	
Electric Fields Induced Into Interconnecting Cables	19.3.3	AC	
Spikes Induced Into Interconnecting Cables	19.3.4	AC	
Radio Frequency Susceptibility	**20**		
Conducted Susceptibility (CS) – 10kHz to 400MHz	20.4	T	
Radiated Susceptibility (RS) – 100MHz to 18GHz	20.5	T	
Emission of Radio Frequency Energy	**21**		
Conducted RF Emission	21.4	B/M	See Cat. on O&I drawing
Radiated RF Emission	21.5	B/M	See Cat. on O&I drawing
Electrostatic Discharge (ESD)	**25**		
Electrostatic Discharge (ESD)	25.5	A	
Flammability	**26**	N/A	Flammability testing in accordance with 14 CFR 25.853 Appendix F

9.4. Supported Video Resolutions

9.4.1. CVBS/Composite Resolutions

NTSC (480i/29)

PAL (576i/25)

SECAM (576i/25)

RS-170 B&W (480i/29)

The software continually checks and chooses the appropriate color decoder (NTSC, PAL, or SECAM) based on the analog input signal.

9.4.2. SDI Resolutions

SMPTE 259M

480i/29

576i/25

SMPTE 292M

720p/50, 720p/59, 720p/60

1080i/25, 1080i/29, 1080i/30

1080p/23, 1080p/24, 1080p/25, 1080p/29, 1080p/30

SMPTE 424M

1080p/50, 1080p/59, 1080p/60

10. DEFINITIONS

3G HD-SDI	Newer, high-definition serial digital interface with a single 2.970 G/bit/s serial link
A	Amps
AF	Audio frequency
CFR	Code of Federal Regulations
CVBS	Color Video Blanking and Sync (Composite video signal)
DVI	Digital Visual Interface
EUT	Equipment under test
HD	High Definition
HDMI	High Definition Multimedia Interface
HD-SDI	High Definition Serial Digital Interface
LCD	Liquid Crystal Display
LED	Light emitting diode

NTSC National Television Standards Committee; an analog video standard used in the United States, Canada, Japan, Mexico, the Philippines, South Korea, Taiwan, and some other countries

O&I Outline and Installation (drawing)

OSD On Screen Display – the actual user/technician menu, and any informational readouts displayed on the image.

P/N Part Number

PAL Phase alternate (by) line – the analog video specification used by most European countries and their former colonies worldwide

PC Personal computer

RF Radio frequency

RS-232 Standard for serial binary data interchange

RTCA Radio Technical Commission for Aeronautics

SDI Serial Digital Interface

SECAM (*Séquentiel couleur à mémoire;* French for "sequential color with memory"), an analog color video system first used in France

SMPTE Society of Motion Picture and Television Engineers – timecode frame rates

SHCS Socket head cap screw

TTL Taxiing, takeoff, and landing

V Volts

VDC Volts direct current

VGA Video Graphics Array

Vpp Volts peak-to-peak

W Watts

11. REVISION HISTORY

NOTICE Revision E is limited to draft or prototype documents. Revisions I, O, Q, S, X and Z are not to be used.

Revision	Date	Revision Description	EC
A	10/09/13	Initial release	13-0370
B	04/17/14	Corrected CVBS Micro-D Base part numbers	14-0143